

podomere of the mandibular palp in *C. hoffi* are diagnostic characters of the Acuminata group. The new species resembles *C. acuta* Hoff, 1942, very closely; however, the two species may be readily distinguished by the structural differences of the reproductive organs. Hoff (1942) describes the ovary of *C. acuta* thus: "The ovary appears as a narrow band, posteriorly much more narrowed than in most Candona." The ovary of *C. hoffi* forms a relatively wide band of uniform width over its entire length. In *C. acuta* the genital lobe as shown by Hoff (1942: fig. 69) is a single rounded structure barely reaching beyond the dorsal ramus of the furca. The genital lobe in *C. hoffi* is bifurcated; the ventral lobe is longer and more pointed than the dorsal. Both lobes extend well beyond the dorsal ramus of the furca.

*Type locality*.—The type specimens were collected on January 11 and 25, 1951 from a drainage ditch on Eldon Hall farm near Princess Anne (Somerset County) Maryland. The temperature of the air and water was 0 degrees Centigrade on January 25; collections on this date were made from water covered by a thin sheet of ice. The muddy water that was always present also served as the habitat for green algae of several kinds, for

numerous rotifers, and for the ostracod *Cypridopsis vidua*.

*Type specimens*.—The two stained permanent mounts of dissected specimens from which the description of the new species reported in this paper was made have been deposited in the U. S. National Museum, nos. 93561 and 93562.

#### LITERATURE CITED

- DOBBS, CATHERINE N. *Fresh-water Ostracoda from Washington and other western localities*. Univ. Washington Publ. Biol. **4**: 174-246. 1941.
- FURTOS, NORMA C. *Ostracoda of Ohio*. Ohio Biol. Surv. **5**: 411-524. 1933.
- HOFF, C. CLAYTON. *Ostracoda of Illinois, their biology and taxonomy*. Illinois Biol. Monogr. **19**: 1-196. 1942.
- SHARPE, RICHARD W. *Contribution to a knowledge of the North American fresh-water Ostracoda included in the families Cytheridae and Cyprididae*. Bull. Illinois Lab. Nat. Hist. **4**: 414-484. 1897.
- TURNER, CHARLES H. *Notes on American Ostracoda, with descriptions of new species*. Bull. Sci. Lab. Denison Univ. **8**: 13-26. 1894.
- . *Fresh-water Ostracoda of the United States*. 2d Rep. State Zoologist Minnesota: 277-337. 1895.

MAMMALOLOGY.—*Three new lemmings (Dicrostonyx) from Arctic America*.

CHARLES O. HANDLEY, JR., United States National Museum.

A revisionary study of the varying or collared lemmings of the genus *Dicrostonyx* has shown that three American populations differ from known races by well-marked distinguishing characters and should be recognized by name. I am indebted to the American Museum of Natural History, the Harvard University Museum of Comparative Zoology, the National Museum of Canada, and the University of California Museum of Vertebrate Zoology for the loan of comparative material. In the following discussions, specimens from these museums are indicated by the abbreviations AMNH, MCZ, NMC, and MVZ, respectively, and those from the United States National Museum, including the Biological Surveys Collection, by US. I am particularly grateful to the National Museum of Canada and the U. S. Fish and Wildlife Service for the privilege of designating specimens from the collections in their care as types. Capitalized color terms are from Ridgway, 1912, *Color*

*standards and color nomenclature*. All measurements are in millimeters and are given as averages followed by extremes.

*Dicrostonyx groenlandicus clarus*, n. subsp.

*Type*.—U. S. N. M. no. 290952; old adult male, skin and skull; collected June 16, 1949, by Charles O. Handley, Jr.; near sea-level at Cherie Bay, 5.4 miles ENE. of Mould Bay Station, Prince Patrick Island, District of Franklin, Northwest Territories, Canada (lat. 76° 19' N., long. 119° 02' W.); collector's number 1285.

*Distribution*.—The Parry Islands of the Canadian Arctic Archipelago. Specimens are available only from Melville, Prince Patrick, and South Borden Islands, but the range probably includes also Ellef Ringnes Island, the Bathurst Islands, and other smaller islands of this general area. Zonal range: Arctic.

*Description*.—Adult summer coloration: Mass effect bright gray above; dorsum, except for lighter areas on shoulders, rather uniformly colored from snout to tail; light band on dorsal

hairs typically pure white; subapical orange band on dorsal hairs narrow or absent and contributing little to mass color effect; orange of sides typically invading dorsum in shoulder region only slightly; faint but readily discernible black median dorsal stripe extending from snout to base of tail; rump gray; ear patches between Sanford's Brown and Amber Brown; tail and feet whitish; belly washed with orange ranging in hue from Pale Ochraceous-Buff to Sanford's Brown, darkest color concentrated along midline and on chest, forming an obscure collar; flanks, especially at base of fore leg, tinged with orange of same hue as belly. Juvenal summer coloration: Dorsum grayish-brown, varying with season and individual from Snuff Brown to Sudan Brown; shoulders lighter than remainder of dorsum; black median dorsal stripe well defined and extending from forehead to base of tail; underparts varying from buffy to almost white; throat collar poorly developed. Winter pelage: white. Size large; tail long. Skull large, but light and lacking extreme angularity; rostrum long and narrow; dorsal root of premaxilla narrow; maxillary part of zygoma strongly notched on anterior surface and protruded on posterior surface above infra-orbital canal; supraorbital ridges of frontals generally weakly developed; postorbital process of squamosal poorly developed; zygomata light and parallel to one another in outline; temporal ridges poorly developed, but lambdoidal crest strong; brain case large; auditory bullae relatively small; molars light, triangle pattern compressed antero-posteriorly.

*Measurements.*—Twelve old adults, including the type, from Prince Patrick Island: Total length, 146 (140–154); tail vertebrae, 26 (23–28); hind foot, 21 (19–23); greatest length of skull, 32.4 (31.3–33.5); length of brain case (from dorsal midpoint of foramen magnum to anteriormost projection of parietal), 12.9 (11.5–13.8); median length of nasals, 9.0 (8.5–9.4); greatest breadth of combined nasals, 3.8 (3.4–4.0); least inter-orbital breadth, 3.9 (3.6–4.2); maximum zygomatic breadth, 20.6 (19.4–21.3); breadth of brain case (at constriction behind postorbital processes of squamosals), 13.4 (13.0–13.9); alveolar length of maxillary molar row, 8.2 (8.0–8.5).

*Comparisons.*—Two races require comparison with *clarus*; *groenlandicus* inhabiting the islands to the eastward, and *kilangmiutak* those to the south. In adult summer coloration *clarus* resembles *groenlandicus* in having the dorsum

almost clear black and white and largely lacking orange. However, the black tips of the dorsal hairs are not as long in *clarus*, and a grayer dorsal coloration results. Other characters distinguishing *clarus* are: black median dorsal stripe more pronounced; rump grayer; flanks less bright; underparts considerably paler; throat collar and median ventral stripe better defined. In juvenal summer coloration, *clarus* is darker, more brownish dorsally, and has the median dorsal stripe better defined and more extensive. The skull of *clarus* is similar in general to that of *groenlandicus*, but shows the following differences: lighter and less angular; nasals somewhat shorter; dorsal root of premaxilla narrow; supraorbital ridges less strongly developed and usually well separated; zygomata parallel-sided and not rounded in outline; brain case longer; triangle pattern of molars more compressed; auditory bullae less inflated.

From *kilangmiutak*, summer adult *clarus* differs as follows: dorsum more grayish, and lacking pinkish cast in the shoulder region; ear patches darker; orange flank color darker, less pinkish, and less extensive; orange median ventral stripe longer and better defined. In juvenal summer pelage: slightly darker dorsally; median dorsal stripe slightly better defined; throat collar less developed. The skull of *clarus* differs significantly from that of *kilangmiutak* in having much larger size, more angular and heavier construction, longer rostrum and nasals, wider nasals, less developed supraorbital ridges, more conspicuously notched zygoma (anteriorly above infra-orbital canal), more parallel sided zygomata, narrower dorsal root of premaxilla, and more prominent temporal ridges.

*Specimens examined.*—Canada, N.W.T.: MELVILLE ISLAND, Liddon Gulf, 1 (NMC); Winter Harbor, 5 (US); no specific locality, 1 (NMC). PRINCE PATRICK ISLAND, vicinity of Mould Bay, 99 (NMC), 68 (US). SOUTH BORDEN ISLAND, south coast, 1 (NMC).

***Dicrostonyx groenlandicus lentus*, n. subsp.**

*Type.*—Nat. Mus. Canada no. 11404; old adult male; skin and broken skull; collected June 13, 1931, by J. Dewey Soper at Lake Harbor, Baffin Island, District of Franklin, Northwest Territories, Canada (62° 43' N., 69° 41' W.); collector's number 2384.

*Distribution.*—Approximately the southern half of Baffin Island, Northwest Territories, Canada. North at least to Nettilling Lake and

Cape Mercy; south to Hudson Strait. Zonal range: Arctic.

*Description*.—Adult summer coloration: Black in dorsal pelage reduced and light band on dorsal hairs pale buff, rendering mass effect between Avellaneous and Drab; black median dorsal stripe not well defined; ear patch Ochraceous-Tawny; feet and tail whitish; orange wash on flanks reduced and not extending on dorsum in shoulder region; underparts typically pale (Pale Ochraceous-Buff to almost white); throat collar and orange median ventral line pale, but well defined because of lighter background. Juvenal summer coloration: Dorsum relatively dark (Sayal Brown); shoulders scarcely differentiated from remainder of dorsum; black median dorsal line well defined; belly light buff to whitish; throat collar poorly developed. Winter pelage: white. Size small. Skull small, light, and lacking angularity; nasals long and narrow; dorsal root of premaxilla wide; anterior notch and posterior protuberance on zygoma above infraorbital canal poorly developed; supraorbital ridges strongly developed; postorbital process of squamosal well developed; zygomata of very light construction, rounded in outline; maxillary molars small and light, triangle pattern slightly compressed antero-posteriorly.

*Measurements*.—Four adults (including the type) from southern Baffin Island: Total length, 129 (type only); tail, 18 (type only); hind foot, 12 (type only); greatest length of skull, 29.1 (28.6–29.2); length of brain case, 12.4 (12.4–12.5); median length of nasals, 8.6 (8.4–8.7); greatest breadth of combined nasals, 3.3 (3.1–3.4); least interorbital breadth, 3.7 (3.6–3.8); maximum zygomatic breadth, 18.3 (18.1–18.5); breadth of brain case, 12.3 (12.0–12.6); alveolar length of maxillary molar row 7.2 (6.9–7.4).

*Comparisons*.—In contrast to the bright *groenlandicus*, *lentus* is dorsally pale and dull in adult summer pelage, a consequence of reduction of black and replacement of white with buff on the individual hairs. It has the black median dorsal stripe better defined, and the flanks and underparts less tinted with orange. In juvenal summer pelage *lentus* is much darker brown dorsally than *groenlandicus*. Cranially, *lentus* is quite similar to *groenlandicus*, differing principally in smaller size and less angularity of the skull. In addition, it lacks the anterior notch and posterior protuberance of the zygoma above the infraorbital canal, and its molars are smaller.

In coloration *lentus* is similar to *hudsonius* but is slightly paler, duller, and more buffy on the dorsum, has a less well defined black median dorsal stripe, has the belly generally lighter and less cinnamon, has the throat collar paler and less extensive, and has a more pronounced orange median ventral line. The dorsum of the juvenal summer pelage is not so yellowish in *lentus*. With regard to the cranium, *lentus* is strikingly smaller and more fragile than *hudsonius*, and lacks angularity. Furthermore, it lacks the great development of the anterior notch and the posterior protuberance above the infraorbital canal on the zygoma, and the heavy, blunt postorbital process of *hudsonius* is replaced by a much smaller structure.

In adult summer coloration, *lentus* is quite unlike *richardsoni*, being much paler and duller in general, less brown and red on the dorsum, much paler on the underparts, and with the black median dorsal stripe poorly developed. The juvenal summer pelage in the two races is similar, except that *lentus* averages somewhat paler and usually has a less prominent black median dorsal stripe. In *lentus* the skull is smaller, somewhat lighter and less angular, the nasals are longer and narrower, and the zygomata are lighter.

*Specimens examined*.—Canada, NWT, BAF-FIN ISLAND: Amadjuak Bay, 6 (NMC); Bowdoin Harbor (Schooner Harbor), 1 (MCZ); Bowman Bay (Camp Kungovik), 1 (NMC); Cape Dorset, 6 (NMC); Cape Mercy, 1 (US); Gordon Bay (Ikkarashuk), 1 (NMC); Lake Harbor, 6 (NMC); Nettilling Lake, 5 (NMC); "southwest coast", 3 (MCZ); "Baffin Island," 2 (MCZ).

*Dicrostonyx unalascensis peninsulae*, n. subsp.

*Type*.—U. S. N. M. (Biol. Surv. Coll.) no. 246377; old adult female; skin and skull; collected May 8, 1925, by Olaus J. Murie near sea-level at Urilla Bay, Unimak Island, Alaska; collector's number 1993.

*Distribution*.—Southwestern Alaska, including Unimak Island, the eastern side of the Alaska Peninsula to Chignik, and the Bering Sea coast from Isanotski Strait to Nushagak. Zonal range: Subarctic.

*Description*.—Adult summer coloration: Red of flanks extending prominently as a wash on dorsum; subapical orange bands of dorsal hairs wide; black tips of dorsal hairs narrow; total color effect of dorsum reddish-brown, between Tawny and Orange-Cinnamon; nape and cheeks



buffy, poorly distinguished from dorsum; ear patches about Sanford's Brown; black median dorsal stripe pronounced; feet and tail whitish; underparts between Pale Yellow-Orange and Light Buff; throat collar wide and dark, but poorly defined (about Amber Brown); well defined median ventral stripe of same color extending from collar to middle of belly. Juvenal summer coloration: Dorsum dark and bright, between Cinnamon-Brown and Dresden Brown in mass effect; cheeks and ear patches similar to remainder of dorsum; black median dorsal stripe well developed; underparts buffy, with poorly defined brownish collar. Winter pelage: At least some individuals white. Size small. Skull small, but heavy and angular in construction; nasals short and wide; zygoma not or only slightly notched anteriorly above infraorbital canal; posterior protuberance of zygoma above infraorbital canal fairly well developed; zygomata heavy and of tear-drop shape in outline, tapering posteriorly; postorbital process of squamosal large and blunt; supraorbital ridges poorly developed; temporal ridges prominent; brain case short and narrowed posteriorly; molars large and heavy; auditory bullae small and not inflated.

*Measurements.*—Three old adults (including type) from Unimak Island. Total length, 132 (130–133); tail vertebrae, 15 (11–18); hind foot 19 (19–19); greatest length of skull, 28.6 (28.2–28.9); length of brain case, 11.8 (11.5–12.0); median length of nasals, 8.4 (8.3–8.5); greatest breadth of combined nasals, 3.5 (3.4–3.5); least interorbital breadth, 3.8 (3.7–3.8); maximum zygomatic breadth, 18.7 (18.7–18.7); brain-case breadth, 11.7 (11.5–11.9); alveolar length of maxillary molar row 7.6 (7.3–7.9).

*Comparisons.*—*D. u. peninsulae* must be compared with two other populations: that represented by *D. u. unalascensis* to the south, and that inhabiting the Bering Sea coast to the north.

The latter has been considered a segment of *D. groenlandicus rubricatus*, whose type locality is Bering Strait, and whose extensive range includes the arctic coasts of Alaska and Canada. However, the lemmings of the northern Bering Sea coast of Alaska are quite distinct from *rubricatus*, having the skull smaller and lighter, the nasals narrower, the supraorbital ridges stronger, and the dorsal pelage much more brownish in summer. The name *Dicrostonyx nelsoni* Merriam (type locality: St. Michael, Norton Sound, Alaska) is available for this population, which should therefore be called *Dicrostonyx groenlandicus nelsoni*.

In adult summer pelage *D. u. peninsulae* resembles *D. g. nelsoni*, but has the black in the dorsal pelage reduced; the cheeks more buffy; the black median dorsal stripe better developed; the red on the flanks less extensive; the underparts more yellowish; and the throat collar darker. The skull of *peninsulae* is smaller, heavier, and more angular; the nasals and rostrum are shorter and wider, the zygomata are heavy and tear-drop shaped rather than rounded; the postorbital process of the squamosal is larger and blunter; the temporal ridges are stronger; the braincase is shorter and narrower posteriorly; the molars are larger and heavier; and the auditory bullae are smaller and less inflated.

From *D. u. unalascensis* in summer pelage, *peninsulae* differs in having the dorsum lighter, brighter, and more reddish; the flanks more reddish; the black median dorsal stripe better defined; the belly more yellowish, and the throat collar neither so dark nor so extensive. In size, *peninsulae* is much smaller. The skulls of the two forms are almost identical except in size.

*Specimens examined.*—ALASKA: Chignik, Alaska Peninsula, 1 (US); Muller Bay, Alaska Peninsula, 1 (AMNH); Nushagak, 4 (US); Urilla Bay, Unimak Island, 4 (US).